

REPORT TO THE CALIFORNIA FISH AND GAME COMMISSION

California Recreational Fisheries Survey 2007 Annual Review



Prepared by
Department of Fish and Game – Marine Region

September 2008



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Introduction

The California Recreational Fisheries Survey (CRFS) collects data on California's marine recreational fisheries, and estimates the catch and effort of anglers fishing for marine finfish in California. The survey was instituted in January 2004, and is a collaborative effort between the California Department of Fish and Game (Department) and the Pacific States Marine Fisheries Commission (PSMFC) with funding from state and federal sources.

The goal of the CRFS is to provide the marine recreational fisheries data needed to manage California's marine resources in a sustainable manner. The CRFS improves upon the previous statewide recreational fishing survey (Marine Recreational Fisheries Statistics Survey) by increasing field sampling efforts, employing refined methods of effort estimation, and providing estimates for six geographic regions on a monthly basis.

Methods

The CRFS is a multi-part voluntary survey conducted in the field and by telephone. Field sampling is conducted during daylight hours at over 400 sites that are accessible to the public and to the field samplers. The CRFS samplers intercept anglers who have completed fishing trips on piers, jetties, beaches, public launch ramps, and commercial passenger fishing vessels (CPFVs). Samplers ask the anglers questions about their fishing activities, examine their catch to determine the number and kinds of fish kept or discarded, and weigh and measure the catch. At the public launch ramp sites, anglers who fished aboard private skiffs are asked to provide fishing location and depth information. In addition, samplers ride aboard CPFVs and record fishing location, depth, species kept and species released at each stop or drift on the CPFV trip.

A contractor conducts a telephone survey of licensed anglers for information on effort when field observations are not feasible, such as night-time fishing and fishing from boats that return to privately-accessed marinas where a sampler cannot enter. The telephone survey is based on a database of anglers who volunteer their name and telephone number to a license agent when they purchase a California sport fishing license. The contractor also conducts a monthly telephone survey of approximately 10 percent of CPFV operators to estimate effort for this component of the fishery.

The data gathered from field sampling, the telephone survey of licensed anglers, the telephone survey of CPFV operators, and sport fishing license sales statistics are combined to estimate catch and effort for the marine recreational finfish fisheries in California. Catch and effort estimates are reported monthly by six geographical districts (Appendix A) and the four modes of fishing (man-made structures, beaches and banks, commercial passenger fishing vessels, and private and rental boats). The CRFS estimates are available online at the Recreational Fisheries Information Network (RecFIN) website: www.recfin.org/forms/est2004.html. Some of the 2007 survey results are presented in Appendix B.

Achievements in 2007

Sampling: In 2007, about 40 CRFS samplers interviewed more than 60,000 anglers (Figure 1) about their fishing activities, and examined the catch from more than 98,000 anglers. Samplers examined and identified more than 195,000 fish, measured more than 107,000 fish, and weighed more than 64,000 fish. The telephone survey completed nearly 26,000 interviews. For the year, each publicly accessible launch ramp and hoist was sampled from 10 to 25 percent of the days, each man-made structure was sampled 10 percent of the days, each beach or bank site was sampled three percent of the days, and about three percent of the CPFV trips were sampled.

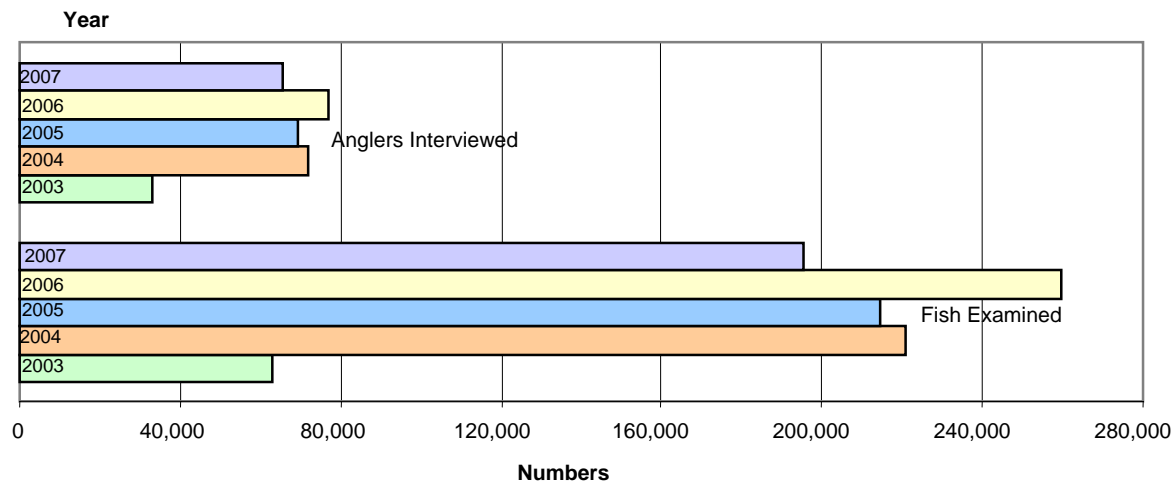


Figure 1. Comparison of annual sampling measures for the CRFS from 2004 through 2007 with those for the previous statewide sampling program (Marine Recreational Fisheries Statistics Survey) in 2003.

2007 Outreach Efforts: On a daily basis, 20 to 40 CRFS samplers are in the field, and as part of their daily duties, the samplers provide anglers with information about the survey and respond to anglers' varied questions and concerns about California's fisheries and resource management. Samplers routinely assist anglers with fish identification, particularly for prohibited species such as canary and yelloweye rockfishes.

Samplers also support the California Fishing Passport program by handing out passports and fish identification material, and stamping passports when requested by anglers. Department and the CRFS staff prepared outreach materials about the CRFS, and wrote articles that were printed in the Department's *Marine Management News* (Appendix C). The Department, in coordination with the telephone survey contractors, conducted outreach to more than 1,800 license agents to encourage their support and cooperation in asking anglers, when purchasing a sport fishing license, to provide their contact information for the angler telephone survey. The Department provides online information about the CRFS at: <http://www.dfg.ca.gov/marine/crfs.asp>.

Assistance with Lobster Study: The CRFS samplers began collecting data on the recreational fishery for California spiny lobster in the fall of 2007. While the focus of the CRFS continues to be recreational finfish fisheries, the samplers are collecting data on invertebrates when they are encountered during scheduled CRFS sampling. The data collected on spiny lobster will be used in a Department study on the recreational fishery for California spiny lobster. The study is part of the Ocean Protection Council-Department of Fish and Game Joint Work Plan, and its goal is to evaluate the efficiency of gears used in the recreational spiny lobster fishery and to gather essential fisheries information. The CRFS samplers, along with additional PSMFC and Department personnel from the Southern California CRFS districts examined 1,427 lobsters and obtained 318 length measurements. Samplers also obtained data on what gear types were used to catch spiny lobsters and the number of short lobsters released. This study will continue in 2008.

Improvements in the Estimation Methods: A review of the first three years of the CRFS data was undertaken in 2007 to improve the analyses and estimation procedures. This resulted in changes to the estimation procedures for private and rental boats and man-made structures, modification of district boundaries to more closely match groundfish and salmon management boundaries, and aggregation of trip-type categories to improve precision. The new methods were implemented, and revised estimates of catch and effort for 2005, 2006, and 2007 were released on the public RecFIN website in February 2008.

Private/Public-Access Catch Comparison Pilot Study: The CRFS study design assumes that the catch rates of anglers on boats returning to private-access sites are the same as those returning to publicly-accessible launch ramps and hoists where the CRFS field sampling occurs. A pilot study was conducted test the assumption. In this context, private-access sites are simply ones that CRFS samplers cannot access. This could be due to a locked gate at a public or private marina, or because the site is part of a private residence. The study compared the catch rates of anglers on boats that returned to private-access sites with the catch rates of anglers on boats that returned to public-access sites. The study participants were recruited from the telephone survey of licensed anglers and asked to submit monthly fishing activity logs. Logs from 319 private-access trips and 433 public-access trips were submitted and analyzed.

The analyses show that anglers who fished from boats returning to private-access sites took longer trips and tended to fish from bigger boats than anglers on boats returning to the public-access sites. There was also a difference in where fishing occurred: anglers on boats that returned to public-access sites tended to fish nearer to shore than anglers on boats that returned to private-access sites. Some differences were seen in the target species and the number of trips taken between the two groups. The report on this study is currently under review and will be submitted to the RecFIN Technical Committee for consideration of future changes needed to address the differences between these sectors of the sport fishery. It is also the basis for a larger study that will be conducted in 2008 and 2009 as part of the Ocean Protection Council-Department of Fish and Game Joint Work Plan (see Plans section below).

Plans for 2008

Method Validation: Validating the methods the CRFS uses to estimate catch and effort continues to be a goal for the CRFS. Two studies are planned to verify and improve the methods used for estimating catch and effort for private and rental boats that return to private-access sites at the end of the fishing trip. Both studies are part of the Ocean Protection Council-Department of Fish and Game Joint Work Plan.

Full-Scale Private/Public-Access Catch Comparison Study: The Department is using the information learned in the pilot study (see Achievements section above) to develop a panel study to collect information from public-access and private-access anglers. Telephone-, mail-, or web-based methods will be used to collect information related to catch and catch rates of the two groups of anglers. The study will test whether there are biases in the current methods. The Department is working with a national panel, the Marine Recreational Information Program, convened by National Marine Fisheries Service, to develop methodologies for the survey design.

Private-Access Effort Study: The CRFS effort estimates for private-access fishing are based on data collected from the telephone survey of licensed anglers. The Department will make field-based counts of boats returning to private-access marinas, moorings and docks to validate the effort estimates from the telephone survey to determine if the methods can be improved. The study will be conducted in the South District (San Diego, Orange, and Los Angeles counties) - the CRFS district with the highest concentration of private-access sites. There are more than 33,000 private-access slips and moorings in the South District; however, not all these slips and moorings are used by recreational fishing boats.

2004 Revised Estimates: The CRFS survey began January 2004 though it was not until mid-2004 that some inconsistencies in the telephone survey were discovered. Because of the concerns with the early 2004 data, the 2004 estimation programs need to be reviewed and revised. In 2008, the Department and PSMFC will complete a review with a goal of posting the revised 2004 estimates on the RecFIN website by the end of 2008.

Costs

Source of Funds: The State of California pays nearly 60 percent of the costs of the CRFS while federal funds comprise the remainder. The State contributed a total \$1.9 million in FY06/07.

Table 1. Source of funds for the California Recreational Fisheries Survey, FY06/07.

Source of Funds	Amount (millions of dollars)	Percent of Total
State contribution – various fund sources (contract for sampling and Department PYs)	\$ 1.9	60%
Federal RecFIN Grant to PSMFC (California portion and estimated cost of data entry)	\$ 0.3	9%
Federal augmentation for California sampling	\$ 1.0	31%
Total	\$ 3.2	

Hours Volunteered by Public: The CRFS relies on the voluntary participation of the fishing public whether by contributing fishing and catch information at a fishing site or by being interviewed on a telephone survey. In total, the public contributed more than 6,000 hours of time providing information about their fishing activities: approximately 3,000 hours participating in field interviews and creel census, and approximately 3,000 hours participating in the telephone survey for effort.

Appendix A. The CRFS Districts

- 1. South District** - Los Angeles, Orange and San Diego counties.
- 2. Channel District** - Santa Barbara and Ventura counties.
- 3. Central District** - Santa Cruz, Monterey, and San Luis Obispo counties.
- 4. San Francisco District** - Marin, San Francisco, San Mateo, and Sonoma counties on the coast and seven counties surrounding San Francisco and San Pablo bays (Alameda, Contra Costa, Solano, Sonoma, Marin, San Francisco, and San Mateo counties).
- 5. Wine District** - Mendocino County and the Shelter Cove section of Humboldt County.
- 6. Redwood District** - Del Norte County and the northern part of Humboldt County.

Appendix B. Survey Results

The South District ranked number one in terms of the number of angler trips, with more than half of the trips in the state occurring in this district in 2007 (Table B1). This is a reflection of the number of people living in this highly urbanized district, mild weather conditions, the diversity of sport fish species, and the availability of facilities such as marinas, launch ramps, and piers. Effort was the lowest in the two northernmost districts: Wine District and Redwood District.

Table B1. Estimated number of angler trips in 2007 by district and fishing mode.

District	Fishing Mode				Total
	Man-made Structures	Beaches and Banks	Commercial Passenger Fishing Vessels	Private and Rental Boats	
1. South	1,144,114	611,388	201,947	215,826	2,173,275
2. Channel	197,230	155,321	34,817	24,643	412,011
3. Central	157,502	137,256	43,166	25,245	363,169
4. San Francisco	274,891	294,194	39,238	38,457	646,780
5. Wine	13,481	23,271	5,523	7,094	49,369
6. Redwood	43,393	36,522	4,626	6,889	91,430
Statewide	1,830,611	1,257,952	329,317	318,154	3,736,034

The CRFS data extracted from RecFIN database at <http://www.recfin.org/forms/est2004.html>

Effort varied seasonally with the greatest effort in the summer months (Figure B1). Effort in central and northern California (districts 3-6) has generally declined over the past three years in both the shore modes (man-made structures and beach and bank) and the boat modes (private/rental boats and CPFV) (Figure B2).

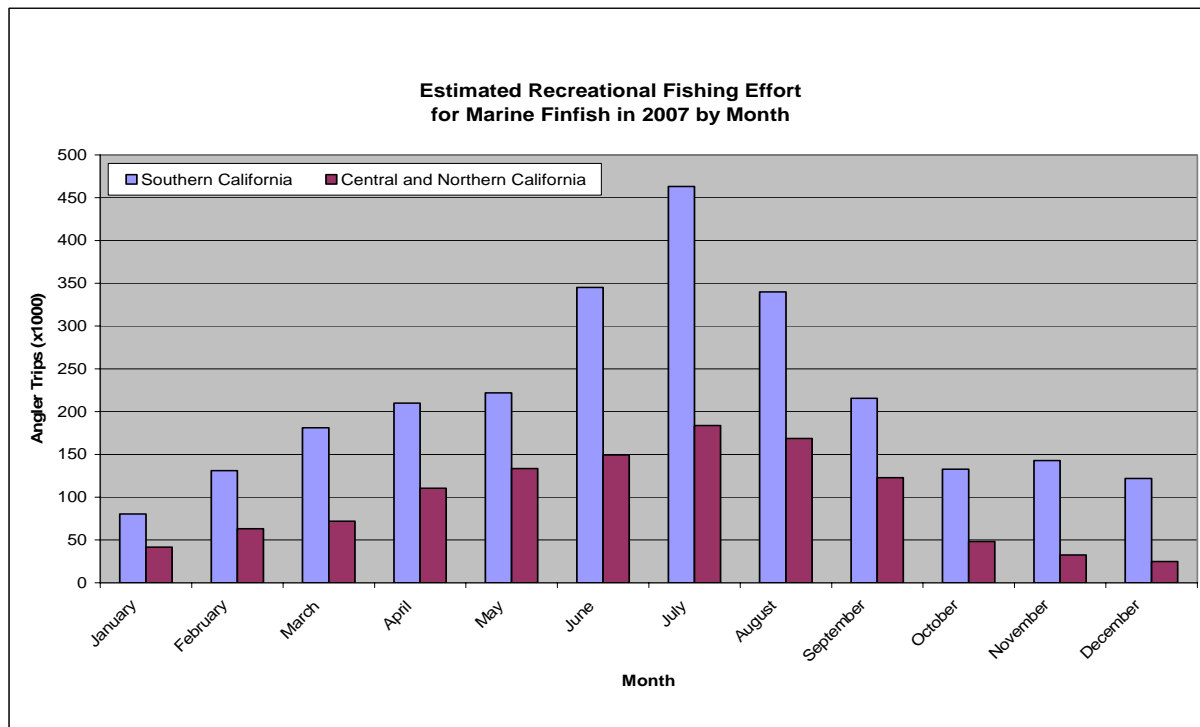


Figure B1. Estimated number of angler trips in 2007 by region and month. The southern California region encompasses the CRFS Districts 1 and 2; central and northern California region includes the CRFS Districts 3, 4, 5, and 6.

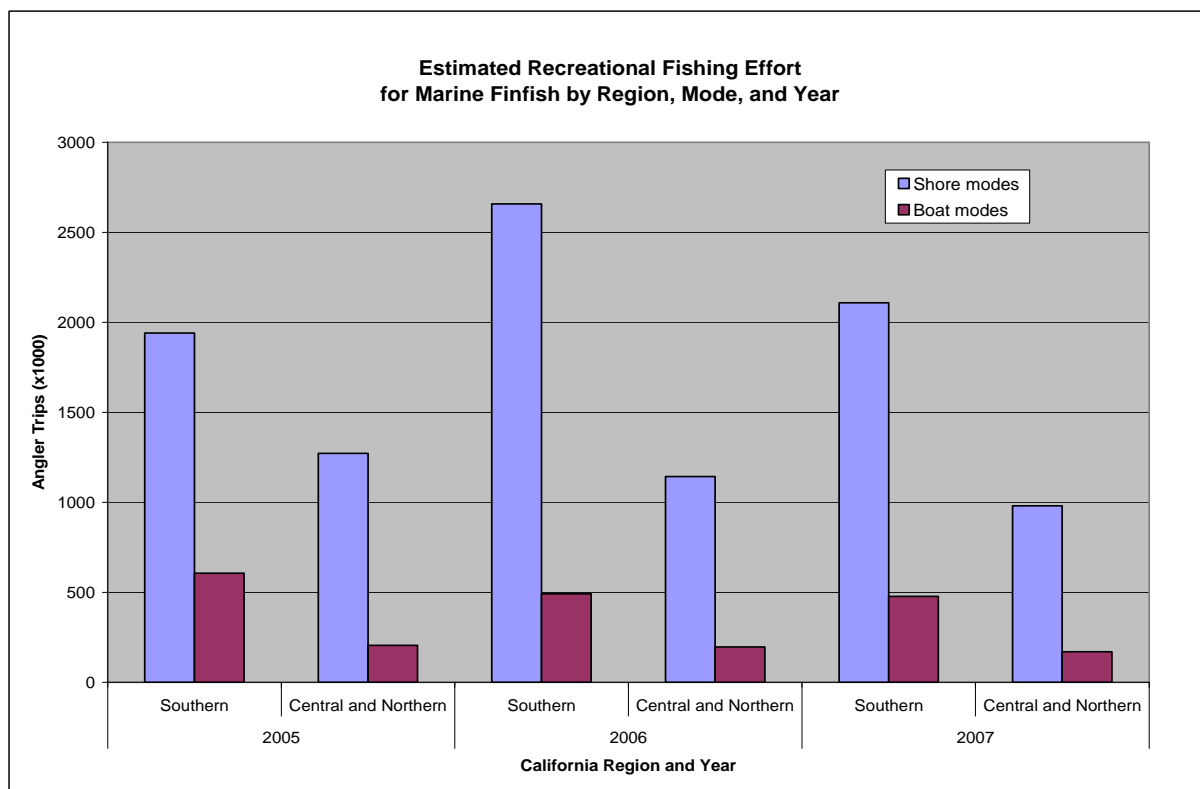


Figure B2. Comparison of the estimated number of angler trips in 2005, 2006, and 2007 by region and type of fishing (mode).

A diverse array of finfish is caught in California's recreational fisheries (Table B2). By number, tunas, mackerels, croakers, rockfishes, and scorpionfish are among the most common species taken in the Southern California catch. Rockfishes dominated the catch in central and northern California in 2007 followed by surfperch. By weight, rockfishes and scorpionfish dominated the catch in southern California as well as in central and northern California (Table B3).

Table B2. Types of fish commonly caught by recreational anglers in southern California (districts 1 and 2) and in central and northern California (districts 3-6), and their ranking in 2007 based on the estimated number of fish harvested (fish kept and landed, and fish released dead).

Rank Based on Estimated Number of Fish Harvested	Southern California		Central and Northern California	
	Type of Fish	Estimated Number of Fish Harvested	Type of Fish	Estimated Number of Fish Harvested
1	Tunas and Mackerels	1,337,219	Rockfishes	1,013,197
2	Croakers (<i>ie. corvina, corbina, white seabass, white croaker, queenfish</i>)	720,814	Surfperches	369,775
3	Rockfishes and Scorpionfish	601,032	Anchovies	230,891
4	Silversides (<i>Family Atherinidae: topsmelt, jacksmelt</i>)	423,749	Silversides (<i>Family Atherinidae: topsmelt, jacksmelt</i>)	201,386
5	Sand and Kelp Basses	290,506	Tunas and Mackerels	98,531
6	Surfperches	257,087	Flatfishes (<i>sanddab, sole, halibut, turbot, flounder</i>)	69,665
7	Sardines	207,666	Smelts (<i>Family Osmeridae: surfsmelt</i>)	62,276
8	Barracuda	111,626	Greenlings and Lingcod	58,735
9	Flatfishes (<i>sanddab, sole, halibut, turbot</i>)	110,389	Salmon	48,381
10	Sea Chubs (<i>halfmoon, opaleye, zebra perch</i>)	56,137	Croakers (<i>ie. white croaker and white seabass</i>)	37,351

The CRFS data extracted from RecFIN database at <http://www.recfin.org/forms/est2004.html>

The salmon numbers are from the Department of Fish and Game's Ocean Salmon Project

Table B3. Types of fish commonly caught by recreational anglers in southern California (districts 1 and 2) and in central and northern California (districts 3-6), and their ranking in 2007 based on the estimated metric tons of fish harvested (fish kept and landed, and fish released dead).

Rank Based on Estimated Metric Tons of Fish Harvested	Southern California		Central and Northern California	
	Type of Fish	Estimated Metric Tons of Fish Harvested	Type of Fish	Estimated Metric Tons of Fish Harvested
1	Rockfishes and Scorpionfish	394	Rockfishes	710
2	Tunas and Mackerels	334	Salmon	182
3	Kelp and Sand Basses	271	Tunas and Mackerels	206
4	Barracuda	259	Greenlings and Lingcod	160
5	Croakers (<i>ie. corvina, corbina, white seabass, white croaker, queenfish</i>)	184	Surfperches	99
6	Flatfishes (<i>sanddab, sole, halibut, turbot</i>)	83	Flatfishes (<i>sanddab, sole, halibut, turbot, flounder</i>)	76
7	Surfperches	48	Silversides (<i>Family Atherinidae: topsmelt, jacksmelt</i>)	34
8	Silversides (<i>Family Atherinidae: topsmelt, jacksmelt</i>)	36	Croakers (<i>ie. white croaker and white seabass</i>)	6
9	Sea Chubs (<i>halfmoon, opaleye, zebra perch</i>)	28	Anchovies	3
10	Sardines	12	Smelts (<i>Family Osmeridae: surfsmelt</i>)	<1

The CRFS data extracted from RecFIN database at <http://www.recfin.org/forms/est2004.html>

The salmon numbers are from the Department of Fish and Game's Ocean Salmon Project

By type of fish targeted, southern California anglers focused their efforts on bottomfish and inshore species as first and second choices, followed by coastal and highly migratory species. In central and northern California, inshore and bottomfish species ranked highest, followed by anadromous species and salmon. (Table B4).

Table B4. Types of fish commonly targeted by recreational anglers in southern California (districts 1 and 2) and in central and northern California (districts 3-6) and their ranking in 2007 based on estimated numbers of angler trips. For each trip-type, the top species for each area are listed based on the estimated number of fish harvested (fish kept and landed, and fish released dead).

Rank Based on Estimated Numbers of Angler Trips	Southern California		Central and Northern California	
	Trip-Type and Top Species Caught	Estimated Thousands of Angler Trips	Trip-Type and Top Species Caught	Estimated Thousands of Angler Trips
1	Bottomfish: California scorpionfish, kelp and sand bass, rockfish and sanddabs	447	Inshore: Jacksmelt, shiner perch, herring, surfperch, halibut and croakers	132
2	Inshore: Croakers, queenfish, jacksmelt, surfperch, halibut and corbina	396	Bottomfish: Rockfish, sanddabs, and lingcod	120
3	Coastal Migratory: Sardine, mackerels, anchovy, barracuda, bonito, and yellowtail	363	Anadromous: Striped bass, sturgeon and shad	77
4	Highly Migratory: Tunas, sharks, and swordfish	74	Salmonids: Chinook salmon	48
5	Salmonids: Chinook salmon	2	Coastal Migratory: Sardine, mackerels, and anchovy	34

The CRFS data extracted from RecFIN database at <http://www.recfin.org/forms/est2004.html>

Appendix C. Literature on the CRFS

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